Date: Thu, 12 Aug 93 04:30:19 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V93 #8
To: Ham-Homebrew

Ham-Homebrew Digest Thu, 12 Aug 93 Volume 93 : Issue 8

Today's Topics:

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

Date: 11 Aug 93 22:32:23 CST
From: usc!howland.reston.ans.net!vixen.cso.uiuc.edu!moe.ksu.ksu.edu!engr.uark.edu!
news.ualr.edu!athena.ualr.edu!pmstuckey@network.ucsd.edu
Subject: 2-6 meter Transverter?
To: ham-homebrew@ucsd.edu

Hey Brewers,

I am seriously thnking of building the 2 meter to 6 meter transverter
listed in the Feb 1993 edition of "73 Amatuer Radio Today. It is found
on page 26. The article is called "The simplest transvereter."
     Question is... Has anyone built this verter and if so how well
does it work? The author says that it is a little noisy but I guess
I don't understand what a little means. Are we talking OBNOXIOUS or
a little back ground hisssss? Also any tips on building and testing
would be appreciated. Thanks in Advance.

****
*   KB5WCE
           *
*   Peter Stuckey   *
*   Vice President, Univ. Ark. Little Rock Ham Radio Club
           *
*   Internet: "PMSTUCKEY@UALR.EDU" OR "HAM%EIVAX@UALR.EDU"
           *
****

Date: Thu, 12 Aug 1993 03:04:03 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!
darwin.sura.net!news.Vanderbilt.Edu!news@network.ucsd.edu
Subject: Cubic Incher
To: ham-homebrew@ucsd.edu

There was a cubic incher at '92 and '93 Dayton Hamventions.
British G-QRP group had it on display at booth, a member's project, I
believe. Don't recall a kit being offered.

It was either a transmitter or xcvr made of surface mount devices on
cubic inch of pc boards soldered together. May have had a small
hand capacitance keyer on top - cleverly and neatly done work.

I seem to have seen a piece on it in G-QRP's SPRAT but do not find it
among the several issues on hand, nor in QRP Quarterly.

Others may have a reference.

Blue Rose Electronics might have something along this line..
they specialize in SMD kits and parts
538 Liverpool Rd, Great Sankey,
Warrington, Cheshire, England WA5 3LU

And Kanga U-S, pretty much a one person operation, distributes
some of G-QRP members' creations in the US.
Bill Kelsey N8ET 3521 Spring Lake Dr Findlay OH, 45840
(419) 423-5643. 7-11 pm est

He may know of the cubic incher's availability, though I do not see it
in his product handout from the '92 hamvention.

Good luck,

73

Jim Travis AC4JI

Date: Thu, 12 Aug 1993 04:42:32 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!
darwin.sura.net!news.Vanderbilt.Edu!news@network.ucsd.edu
Subject: Cubic Incher - II
To: ham-homebrew@ucsd.edu

More on Cubic Incher...

ARRL Handbooks (Chapter 30) since at least 1989, maybe further back,
have a "Cubic Incher for 80, 40 and 30 meters."

Based on articles in QST, July, 1982 and Sep, 1990 from designs and circuits
by Monticelli AE6C, Bonaguide WA1VUG and DeMaw, W1FB.

Doesn't look very cubic but it is small - a xtal oscillator transmitter with
harmonic filter at output (as described in '93 book).

About 1.75W out with 14v and works OK down to 8 volts, according to the
handbook.

Looks like fun.

Jim Travis, AC4JI

Date: 12 Aug 1993 07:12:12 GMT
From: usenet.coe.montana.edu!netnews.nwnet.net!news.u.washington.edu!
stein.u.washington.edu!algol@decwrl.dec.com
Subject: Cubic Incher Source
To: ham-homebrew@ucsd.edu

I understand that Danny Stevig is selling Cubic Incher Kits for $12.50. If
you are a homebrewer you really ought to give this guy a try -- very
reasonable prices, excellent service, a nice guy, and all kinds of great
stuff. (I've placed 2 big orders with him and been very happy both times).

Dan's Small Parts an d Kits
1935 S. 3rd W. #1
Missoula, MT 59801
(406) 543-2872

I think he asks a dollar for his catalog, or was it just an SASE? I can't find

his add in this month's QST...

Date: 11 Aug 93 01:30:13 GMT
From: molecular19.princeton.edu!yuan@princeton.edu
Subject: HF Active Filters
To: ham-homebrew@ucsd.edu

I am a bit of a armchair homebrewer (I theorize and plan more projects
than I actually build), thus in theorizing I began to wonder why high
frequency active bandpass filters are seldom seen. One could build a
highly selective receiver front end using several very low noise wide
bandwidth op amps (such as the Comlinear CLC425 or the Harris HFA-0002,
both of which have an ~1 Ghz bandwidth and are extremely low noise).
This theoretical bandpass filter could have a Q between 10 to 30, and
using varactors, D/A converters, and digitally adjustable potentiometers,
one could have an adjustable bandpass from 1 to 30 mhz for example. Am I
far off base? (I am not an E.E. by training). I realize this is not the
most economical approach to building a bandpass filter.

Jeffrey Yuan, N2NXC

****
* Jeffrey Yuan   *
* Department of Molecular Biology   *
* Lewis Thomas Laboratory   *
* Princeton University   *
* Princeton, NJ 08544   yuan@phoenix.princeton.edu *
****

Date: 11 Aug 1993 13:29:31 GMT
From: olivea!inews.intel.com!ilx018.intel.com!ilx049!dbraun@uunet.uu.net
Subject: HF Active Filters
To: ham-homebrew@ucsd.edu

In article <1993Aug11.013013.25330@Princeton.EDU>, yuan@phoenix.princeton.edu
(Jeffrey Yuan) writes:
|> I am a bit of a armchair homebrewer (I theorize and plan more projects
|> than I actually build), thus in theorizing I began to wonder why high
|> frequency active bandpass filters are seldom seen. One could build a
|> highly selective receiver front end using several very low noise wide
|> bandwidth op amps (such as the Comlinear CLC425 or the Harris HFA-0002,
|> both of which have an ~1 Ghz bandwidth and are extremely low noise).
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|> one could have an adjustable bandpass from 1 to 30 mhz for example. Am I
|> far off base? (I am not an E.E. by training). I realize this is not the
|> most economical approach to building a bandpass filter.

I suspect that at HF frequencies, the component (R,C)
values would be unrealisticly small, and parasitics
would mess everything up. But if everything was on
one chip, maybe it would work, at least for a 455kHZ IF.

I noticed that cellular phones use ceramic SAW (surface acoustic wave)
filters in their front end (at ~900 MHz). These little babies
are about a quarter-inch on a side, surface-mount, and can apparently
be designed for a large range of bandwidths. Do any ham-band radios use
these? They could be very handy for homebrewing!

--
Doug Braun

Email: dbraun@inside.intel.com
Intel Mail: IDC1-41
iNet: 8-435-5069   Long Distance: 011-972-4-655069
Fax: 8-435-5999   Long Distance: 011-972-4-655999
Snail Mail: US: Other:
                PO Box 311   Intel Israel, Ltd.
                Mendham, NJ 07945   IDC1-41
                                        Matam Scientific Center
                                        Haifa, Israel 31015

Date: 11 Aug 1993 16:56:52 GMT
From: pravda.sdsc.edu!news.cerf.net!usc!sdd.hp.com!hpscit.sc.hp.com!
rkarlqu@network.ucsd.edu
Subject: HF Active Filters
To: ham-homebrew@ucsd.edu

In article <1993Aug11.013013.25330@princeton.edu>,
Jeffrey Yuan <yuan@phoenix.princeton.edu> wrote:
>frequency active bandpass filters are seldom seen. One could build a
>highly selective receiver front end using several very low noise wide
>bandwidth op amps (such as the Comlinear CLC425 or the Harris HFA-0002,
>both of which have an ~1 Ghz bandwidth and are extremely low noise).
>This theoretical bandpass filter could have a Q between 10 to 30, and
>using varactors, D/A converters, and digitally adjustable potentiometers,
>one could have an adjustable bandpass from 1 to 30 mhz for example. Am I
>far off base? (I am not an E.E. by training). I realize this is not the

Leaving out the question of why you wouldn't use a 25 cent inductor to
do the job, you would need to build these filters using "state-variable"
topology. This topology requires a *minimum* gain-BW product equal to:

     center frequency * Q * 3.

(Don't bother with "simpler" topologies. They need MUCH more GBW).
With a Q of 10 at 30 MHz., you would need 900 MHz. GBW which is just
achievable. Unfortunately, the topology is such that the op-amps have
to be stable at a gain of +1, which is not the case for the ones you
cited, nor for any other ones that I know of with a GBW > 900 MHz.
You also cannot use current-feedback amplifiers.
Also, if you operate with just the minimum GBW product, there
will be severe interactions between the amplifier response and the filter
response, so you would have to use compensation techniques to fix this.

Rick N6RK
rkarlqu@scd.hp.com

Date: 11 Aug 93 10:43:11 CDT
From: timbuk.cray.com!hemlock.cray.com!andyw@uunet.uu.net
Subject: Sweep generator plans..
To: ham-homebrew@ucsd.edu

I'd like to build a sweep generator, to help me align & evaluate
the IF stages of receivers. Does anyone have any recommendations
for plans ? I think 10.7MHz & 455KHz would be ok, but if I could
get a variable 20-45 MHz output too, that would help me align
some commercial gear too.

I tried to find a good used generator, but I couldn't find any
that didn't cost and arm & a leg, so I figured it was time to
fire up the soldering iron..

--
andyw.   N0REN/G1XRL

andyw@aspen.cray.com   Andy Warner, Cray Research, Inc. (612) 683-5835

Date: Tue, 10 Aug 1993 17:25:49 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!math.ohio-
state.edu!sdd.hp.com!nigel.msen.com!ilium!rphroy!kocrsv01!c2xjcb@network.ucsd.edu
Subject: Synth for 15 to 20 MHz

To: ham-homebrew@ucsd.edu

There have been some articles in some of the ham mags (I can't recall
offhand which, but I read QST, CQ, and 73, so those are the ones to
look at) in the past few months about Direct Digital Synthesizers
(similar to recent ICOM rigs?) that can be done with a Harris (?) IC.

I believe the DDS described can operate upto about 20-25 MHz with very
fine "steps".
--
James C. Bach Ph: (317)-451-0455 The views & opinions expressed
Advanced Project Engr. GM-NET: 8-322-0455 herein are mine alone, and are
Powertrain Strategy Grp Amateur Radio: WY9F NOT endorsed, sponsored, nor
Delco Electronics Corp. Just say NO to UNIX! encouraged by DE or GM.

Date: 11 Aug 1993 13:32:25 GMT
From: olivea!inews.intel.com!ilx018.intel.com!ilx049!dbraun@ames.arpa
Subject: Synth for 15 to 20 MHz
To: ham-homebrew@ucsd.edu

How exactly do "direct" synthesizers differ from the
usual VCO-divider-PLL setup?

Is it the process where you mix together a lot of combinations
of crystal-controlled frequencies to get what you want?
Doesn't that approach take lots of mixers, filters, etc. that
don't lend themselves to VLSI implementation?

--
Doug Braun

Email: dbraun@inside.intel.com
Intel Mail: IDC1-41
iNet: 8-435-5069 Long Distance: 011-972-4-655069
Fax: 8-435-5999 Long Distance: 011-972-4-655999
Snail Mail: US: Other:
PO Box 311 Intel Israel, Ltd.
Mendham, NJ 07945 IDC1-41
Matam Scientific Center
Haifa, Israel 31015

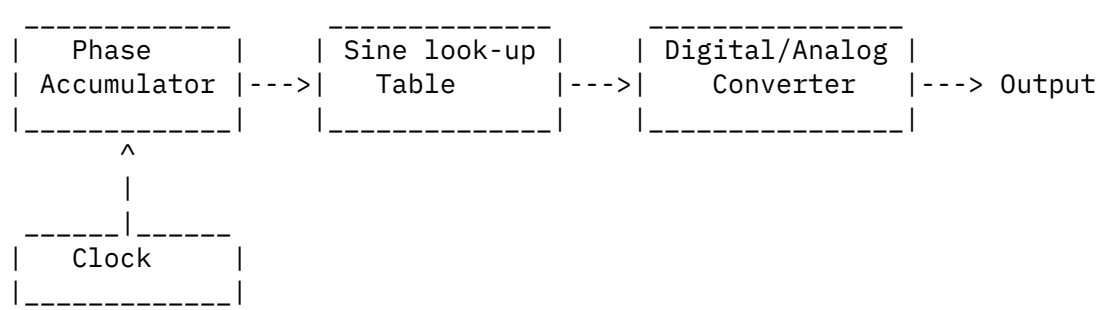
Date: Wed, 11 Aug 1993 20:19:04 GMT

From: sdd.hp.com!hpscit.sc.hp.com!news.dtc.hp.com!srgenprp!alanb@network.ucsd.edu
Subject: Synth for 15 to 20 MHz
To: ham-homebrew@ucsd.edu

Doug Braun (dbraun@ilx049.intel.com) wrote:
: How exactly do "direct" synthesizers differ from the
: usual VCO-divider-PLL setup?

: Is it the process where you mix together a lot of combinations
: of crystal-controlled frequencies to get what you want?

No. DDS generates the output sinewave directly with a DAC. By using
a clock frequency higher than the highest desired output frequency,
you can generate a sinewave at any frequency in the range.



The phase accumulator counts modulo 360 degrees, keeping track of the
phase to many more bits of resolution than the sine look-up table or
the DAC. Once per clock cycle, the accumulated phase is rounded off
to the proper resolution for the look-up table, and the proper DAC
number (possibly interpolated between table points) is loaded.

The advantage of the method is you tend to get much better frequency
resolution than with a phase-locked loop. Resolution is limited only by
the the size of the phase accumulator. The disadvantage is the limited
frequency range, which is limited by the speed of the DSP or dedicated
hardware used to do all the above functions.

AL N1AL

Date: Wed, 11 Aug 1993 22:48:36 PST
From: parc!barrnet.net!infoserv!cpuig!news@decwrl.dec.com
Subject: Synth for 15 to 20 MHz
To: ham-homebrew@ucsd.edu

alanb@sr.hp.com (Alan Bloom) writes:

> No. DDS generates the output sinewave directly with a DAC. By using
> a clock frequency higher than the highest desired output frequency,
> you can generate a sinewave at any frequency in the range.
>

[Very nice explanation deleted]

> the the size of the phase accumulator. The disadvantage is the limited
> frequency range, which is limited by the speed of the DSP or dedicated
> hardware used to do all the above functions.
>

Actually, the frequency range can be relatively large. Single-chip
CMOS DDS devices (some incorporating dual DDSs) top out at around
80 MHz, but more expensive ECL and GaAs devices can operate at up
to 1 GHz. Note that these frequencies are the maximum clock frequencies.
The maximum output frequency is about 40% of the clock.

The main disadvantage of DDSs is their lack of spectral purity. The
output typically contains spurs at much higher levels than either
crystal (no spurs) or well-designed PLL synthesizers (limited spurs).
Some of these spectral components arise from the quantization noise
and aliasing inherent in DSP systems, but in general the spectral
purity is limited by the DAC. Small imperfections in DAC performance
can produce very noticeable garbage in the output.

One can have the best of both worlds by using the DDS to generate
a very fine resolution variable reference for a simple PLL, using
the PLL effectively as a filter to get rid of the spurs. The PLL
can also shift the frequency range of the DDS to expand the overall
frequency coverage.

--
Carlos Puig, KJ6ST cpuig@infoserv.com Campbell, CA

End of Ham-Homebrew Digest V93 #8
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